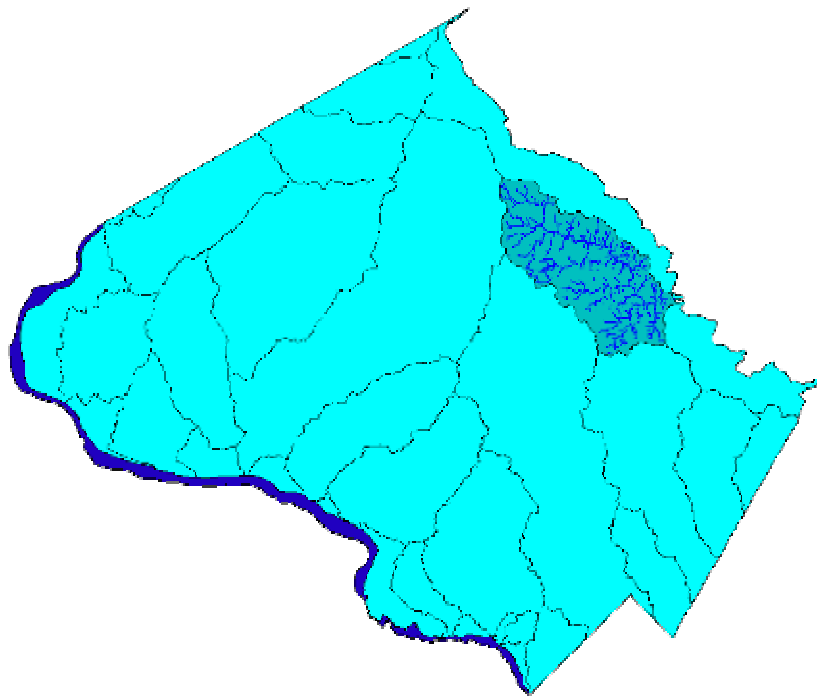


Hawlings River Watershed Restoration Action Plan



December

2003



Montgomery County's Water Quality Goals

Montgomery County has a rich and diverse natural heritage, which includes over 1,500 miles of streams that provide habitat vital to aquatic life. To preserve this natural heritage, the County has adopted the following water quality goals (Montgomery County Code, Chapter 19, Article IV):

- Protect, maintain, and restore high quality chemical, physical, biological, and stream habitat conditions in County streams that support aquatic life and uses such as recreation and water supply;
- Restore County streams damaged by inadequate stormwater management practices of the past by re-establishing the flow regime, chemical and physical conditions, and biological diversity of natural stream systems as closely as possible through improved stormwater management practices;
- Work with other jurisdictions to restore and maintain the integrity of the Anacostia River, the Potomac River, the Patuxent River, and the Chesapeake Bay; and
- Promote and support educational and volunteer initiatives that enhance public awareness and increase direct participation in stream stewardship and the reduction of water pollution.

What is the Countywide Stream Protection Strategy?

The Montgomery County Department of Environmental Protection (DEP) first published the Countywide Stream Protection Strategy (CSPS) in 1998. The CSPS provides County stream resource conditions on a ***subwatershed**** basis and recommends programs or policies to preserve, protect, and restore County streams and ***watersheds***. Stream resource condition results for the year 2003 update are shown in Table 1.

The countywide stream assessment is based on evaluations of aquatic life and stream channel habitat indicators from over 200 monitoring stations. Nearly all Montgomery County streams met Maryland water quality standards and criteria for dissolved oxygen, water temperature, and pH. The quality of the biological community and stream habitat varied significantly.

Stream ***erosion*** and ***sedimentation*** were identified as the major impacts to habitat conditions and aquatic life in County streams. These ***nonpoint source*** impacts originated primarily from increased stormwater runoff from developed areas and agricultural lands, as well as inadequate sediment control from construction sites. The extent of degradation typically reflected the extent to which natural land cover, that is trees and other vegetation, had been replaced by agricultural cropland and pasture or with impervious areas such as roads, parking lots, driveways, and buildings. These land cover changes adversely affect the stream's natural flow regime by increasing stormwater flows and reducing rainwater infiltration back to groundwater.

Table 1. Montgomery County Stream Resource Conditions (1994-2000)

Condition	Monitored Stream Miles	Percent Monitored Stream Miles
Excellent	84	7
Good	694	55
Fair	362	28
Poor	131	10
Total monitored	1,272	100
Not Monitored	226 stream miles	
Total in County	1,498 stream miles	

****Words in bold, italicized typeface are defined at the end of this publication in the glossary***

Watershed Restoration Action Plan

The Hawlings River Watershed Restoration Action Plan is a follow up to the Hawlings River Watershed Restoration Study completed in February 2003. The Plan provides a framework of next steps to implement the Study recommendations and for long-term protection of stream resources.

The Study analyses showed that ultimately, stream resources protection can only be achieved through a combination of **stream restoration**, **riparian buffer** expansion, other agricultural and urban **best management practices (BMPs)**, and public environmental stewardship. This document provides greater details on proposed stream restoration and **retrofit** projects that can be funded through the County's **Capital Improvement Program (CIP)** budget augmented by state and federal grants. To track project progress, look under Watershed Restoration on the DEP web site

<http://www.montgomerycountymd.gov/siteHead.asp?page=/mc/services/dep/index.html>

Public Stewardship--Getting Involved

For successful long-term watershed management, residents and resource users must become active stewards in their everyday activities and through volunteer involvement. Two issues specific to the Hawlings River Watershed are protecting and enhancing riparian buffers and eradicating **invasive plant** species.

In the coming years, the DEP working with other local resource management agencies, will address these issues through a combination of CIP projects and volunteer-based projects. Citizens will be recruited for reforestation and riparian buffer plantings and then to "adopt" these plantings to keep invasive plants from taking over. Numerous invasive plant species were found throughout the watershed, particularly on County parkland, with their rapid and uncontrolled growth choking out and preventing the re-establishment of native species. Those interested in volunteering to control invasive plants on public land can join the Department of Parks' 'Weed Warrior' program (http://www.mc-mncppc.org/Environment/weed_warriors).



Three generations of volunteers



Buffer encroachment

In many areas, the land immediately next to the stream is being mowed or otherwise prevented from growing into a forested buffer, which would provide the best combination of water quality and habitat benefits. In cases of parkland encroachment, the Department of Parks is responsible for enforcement. Success on privately-owned property will require targeted outreach on the importance of stream buffers and education on eliminating invasive plant species. The Montgomery Soil Conservation District will take the lead with owners of agricultural properties to implement the most effective streamside BMPs. The DEP will continue to work

with urban and suburban property owners using programs such as Rainscapes (<http://www.rainscapes.org>) to teach techniques to control urban stormwater impacts, to minimize pollutants and runoff from lawns and landscaping, and to create backyard habitats.

For more information on ways to help your watershed and protect water quality, see the list of contacts on the last page.

Hawlings River Watershed Restoration Study

The Watershed Restoration Study was conducted to identify opportunities to enhance and protect aquatic and riparian habitat in the Hawlings River watershed and to reduce sediment and associated nutrient loadings to the Rocky Gorge Reservoir. This study was initiated in support of Montgomery County's commitment as a signatory of the *Patuxent Reservoirs Watershed Protection Agreement* to protect the watershed, its tributary streams, and the Rocky Gorge Reservoir.

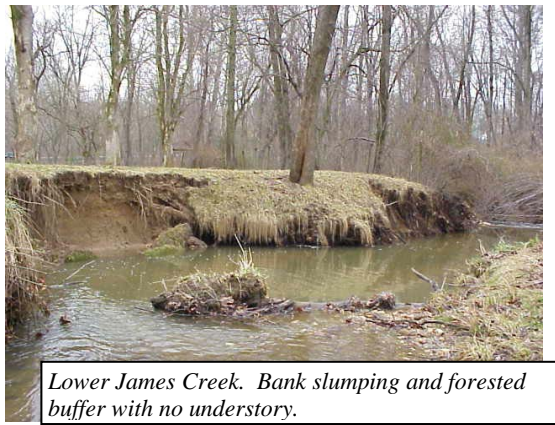
The four part Study used existing biological and physical habitat data and **hydrologic analysis** to identify priority stream reaches, collected stream bank and channel stability data at 8 monitoring stations, conducted field walks in the priority reaches, developed preliminary designs for 12 stream restoration and three **stormwater management (SWM)** retrofit projects, and identified long-term stream protection needs.

To produce the greatest improvements for existing degraded instream habitat and to provide the best opportunity for reducing sediment and associated pollutants., the Study recommended that stream restoration projects should be implemented throughout the watershed, rather than focusing in just the most developed portions. All of the proposed projects also offer good public outreach and stewardship opportunities and possible partnerships with citizens and private and public environmental entities important to long-term watershed management success.

Major Watershed Problems

The study determined that the primary factors affecting instream habitat in the watershed are:

- Uncontrolled runoff that in some intensely developed areas has increased post-development stormwater peak discharges by more than 2000%;
- Lack of or inadequate riparian buffers and unstable stream banks and channels throughout the watershed; and
- Need to improve water quality and quantity control benefits of some existing SWM ponds.

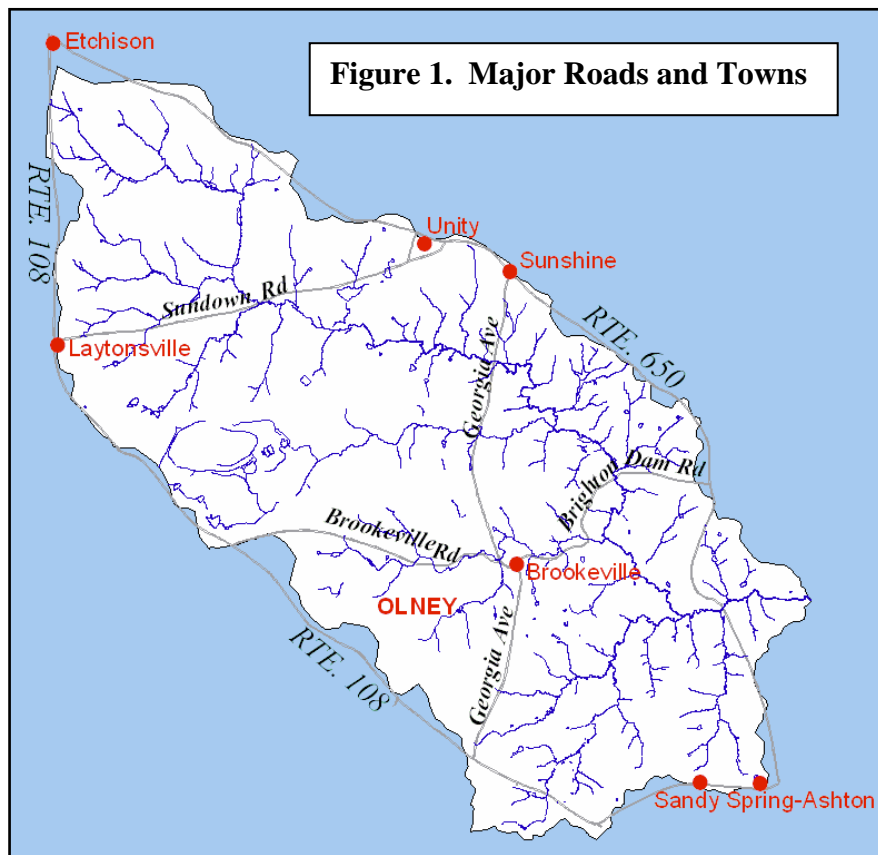


Patuxent Reservoirs Watershed Protection Agreement

The Rocky Gorge (T. Howard Duckett) and Brighton Dam (Triadelphia) reservoirs are part of a regional source of drinking water, primarily for Montgomery and Prince George's counties. Recent monitoring studies showed that nutrient loadings and sedimentation may threaten the long-term water quality and storage capacity of these reservoirs. The potential increases in taste and odor problems of the source water could result in increased drinking water treatment costs. On October 29, 1996, the Patuxent Reservoirs Watershed Protection Agreement was signed to establish an interjurisdictional partnership to develop and implement reservoir watershed protection strategies. The signatories include Howard, Montgomery, and Prince George's Counties, the Howard and Montgomery Soil Conservation District, the Maryland National-Capital Park and Planning Commission (M-NCPPC), and the Washington Suburban Sanitary Commission (WSSC). These signatories, along with seven other state and local resource management agencies, have developed a cooperative work program for data collection and analysis, project implementation, and public outreach. In 2003, the U.S. Environmental Protection Agency recognized the Patuxent Reservoirs Watershed Protection Group as a Clean Water Partner, among 79 groups from across the country who are going beyond regulatory requirements to protect their water resources.

Watershed Characteristics

The Hawlings River is located in the eastern part of the County, draining an area of about 28 square miles and containing about 98 miles of streams. It is a major tributary to the Rocky Gorge Reservoir, one of two drinking water supply reservoirs in the Upper Patuxent.



The Hawlings River passes through three distinct land use areas. The upper watershed above Sundown Road is in rolling agricultural lands east of Laytonsville. This headwater area has many small tributaries that flow to create the Hawlings River **mainstem**. The middle section passes through a narrow, rocky valley where streamflow velocity increases. This section includes the Rachel Carson Conservation Park, where some of the best stream habitat in the watershed is located.

The lower section, below Georgia Avenue, contains tributaries from Lower Olney Mill (very densely developed) and Reddy Branch (a mix of rural residential and agricultural land uses). Here, the soils change to a highly erodible type. This change, coupled with the addition of uncontrolled stormflows from the Lower Olney Mill tributary, has resulted in severe bank erosion throughout the lower Hawlings River mainstem.

Stream Restoration Projects

After the existing data had been reviewed, 12 reaches were identified as priority reaches for streambank stabilization and riparian buffer enhancement projects. The proposed projects, shown in Figure 2, were located in agricultural areas as well as in reaches with existing and expected development. The project descriptions are shown in Table 2. The priority reaches cover about 15 linear miles out of the watershed's 98.2 stream miles. Projects 9, 11, and 10, clustered in the Lower Olney Mill Tributary and Reddy Branch are the three top-ranked projects. These projects are in primarily urban/suburban subwatersheds and represent the most degraded stream conditions in the watershed. Stream restoration concept designs have been developed for the 12 projects to provide possible techniques which address specific erosion, bank instability, and lack of instream habitat problems that exist along each reach.

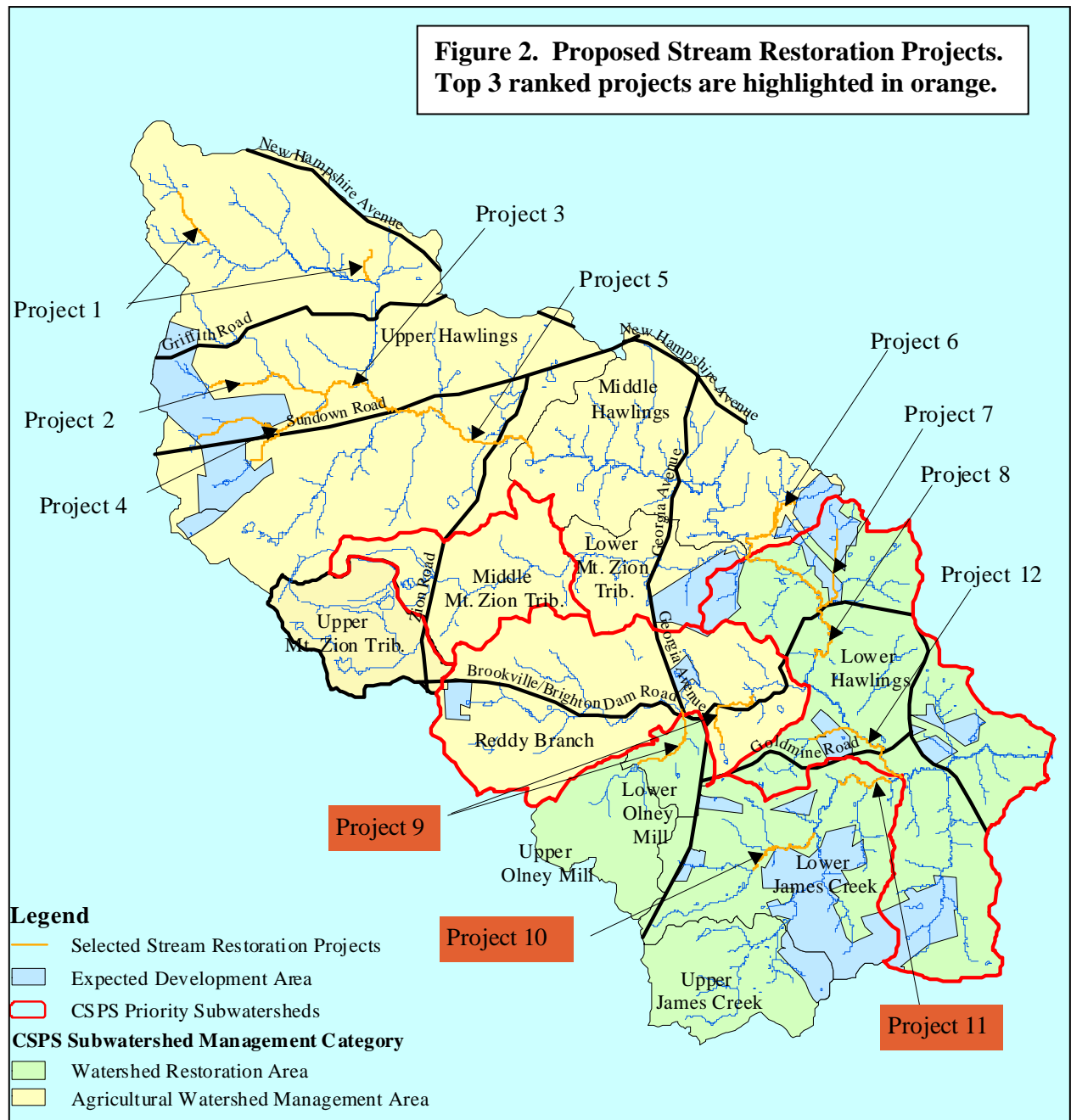


Table 2. Stream Restoration Project Locations.

<u>Number</u>	<u>Name</u>	<u>Location</u>	<u>Length (ft)</u>
1	Upper Hawlings I	Upstream of Griffith Rd.	4,601
2	Upper Hawlings II	South of and generally parallel to Griffith Rd	6,293
3	Upper Hawlings III	Crosses Sundown Rd twice	10,638
4	Upper Hawlings IV	Generally parallel to Sundown Rd.	4,295
5	Upper Hawlings V	Mainstem south of Sundown Rd.	8,612
6	Middle Hawlings	Starts in Hunting Ridge subdivision	5,848
7	Lower Hawlings I	Mainstem above Brighton Dam Rd.	5,262
8	Lower Hawlings II	Mainstem and tributaries south of Brighton Dam Rd	8,410
9	Reddy Branch	Olney Mill subdivision-- Lower Olney Mill Tributary and Reddy Branch	8,303
10	Lower James Creek I	Hallowell Subdivision.	4,976
11	Lower James Creek II	Generally parallel to Gold Mine Rd.	3,528
12	Lower Hawlings III	Near Gold Mine Rd and New Hampshire Ave.	5,963

What is Stream Restoration?

The ultimate goal of stream restoration is to improve instream habitat and support more diverse and vibrant biological communities than exist in degraded conditions. Another important objective is to reduce stream bank and stream channel erosion which will then reduce excessive sediment transport and damages to downstream areas. During stream restoration, carefully placed boulders, logs, and native woody vegetation are used to stabilize eroding stream banks, and to create habitat for fish, aquatic insects, and other wildlife that use the stream and its adjacent terrestrial resources. Special equipment is used to grade stream bank slopes and allow stormwater flows to overflow onto the floodplain where feasible. Trees and shrubs are planted in the riparian areas to increase shading of the stream which helps to maintain cooler summer water temperatures.

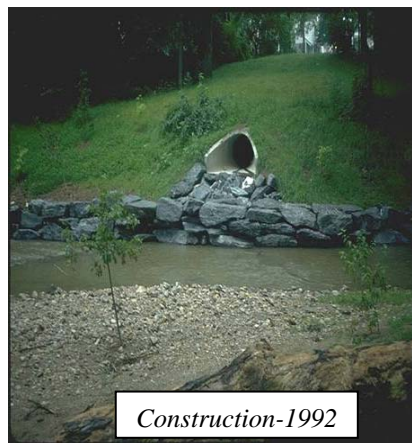
Devastation 1990



Restoration-2000



Construction-1992



Progress in Wheaton Branch Restoration in the Sligo Creek Watershed.

Lower Hawlings River Mainstem Stream Restoration Project #7

A Representative Site

Project #7 will be the first to be constructed. This project covers about 1 mile in the Lower Hawlings River mainstem immediately above Brighton Dam Road. Construction will be in two phases, with the 2,800 feet in the three most downstream reaches (Phase a) to be addressed by December 2004. This project is located in M-NCPPC park property with stream buffer quality ranging from fair to good. The understory is dominated by non-native invasive plants including mile-a-minute weed (*Polygonum perfoliatum*) and Oriental stilt grass (*Microstegium vimineum*). Although medium to large trees are common on the banks in this project, severe erosion is evident in both meanders and straight sections.



Bank erosion and inadequate buffer

Two design considerations were brought up as the concept designs were being developed. One was the possible removal of large trees in order to complete the grading back of stream banks to restore stormwater access to the adjacent floodplain. The second was the removal of some of the many debris jams in these reaches which may be diverting instream flows and further exacerbating bank erosion.



Undercut banks supported by tree roots

Both of these issues are being evaluated in detail during the final design process to determine if the long-term benefits from the constructed project will outweigh the short-term disruptions of the habitat currently provided by the undercut tree roots and instream woody debris.

University of Maryland Cooperative Monitoring Program

From 2000 through 2002, the DEP and the University of Maryland, Aquatic Ecology Lab, have worked in a cooperative monitoring partnership to determine how the timing, rate, and spatial configuration of land conversion influence stream habitat and ecosystem health. Stream conditions in the Paint Branch and Northwest Branch watersheds in Montgomery County, representing mainly older residential development, are being compared to those in the Hawlings River watershed in Montgomery County and the Cattail Creek watershed in Howard County, representing rapidly expanding rural-suburban/urban fringe development. The monitoring includes biology, nutrients, and physical habitat assessments. Future cooperative monitoring in the Hawlings River watershed will focus on those reaches which are undergoing restoration.



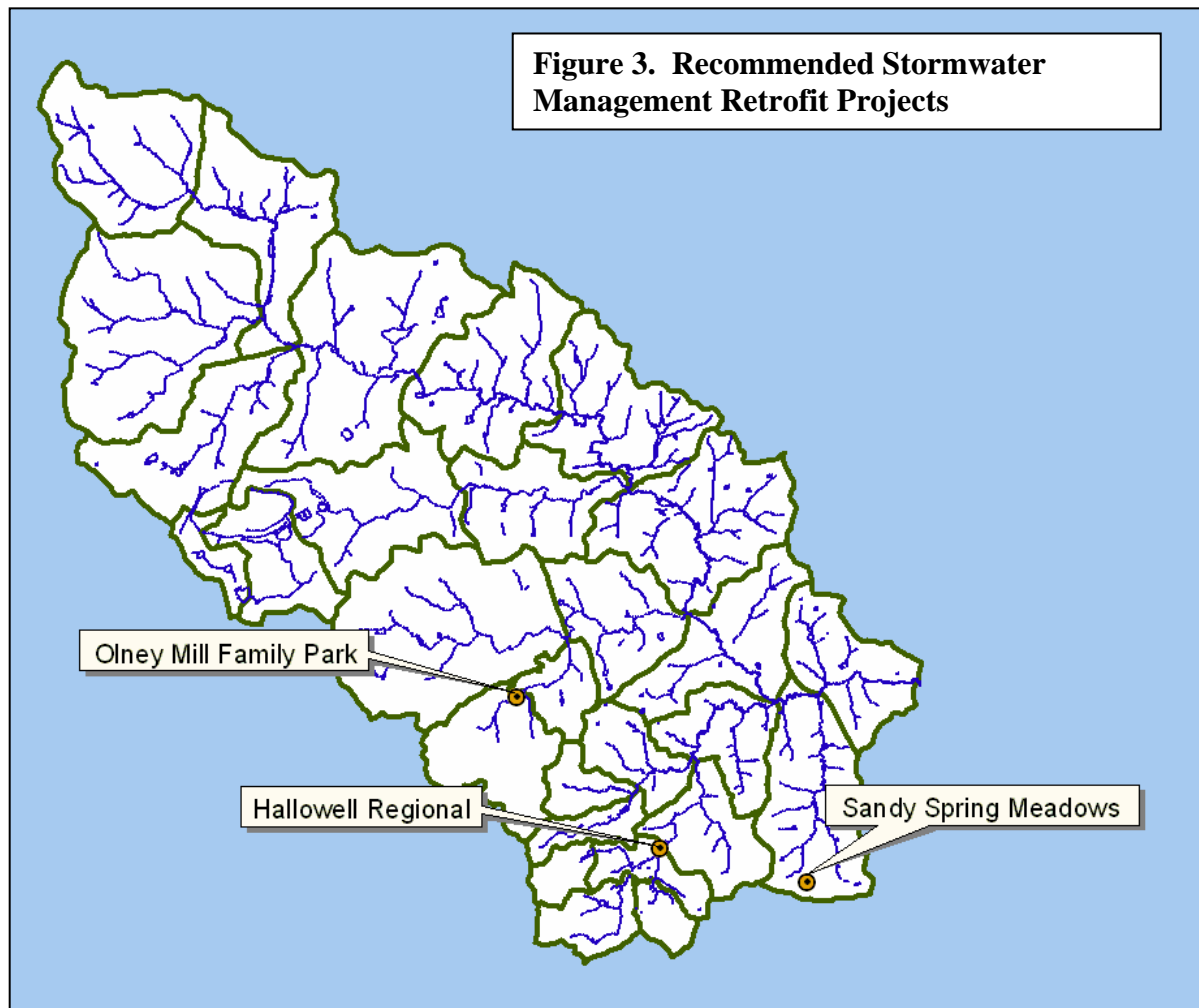
Preparing for nutrient data collection



Cooperative monitoring on the Hawlings Mainstem

Stormwater Management Retrofit Projects

Since most of the watershed is in rural and agricultural areas, there were very few existing stormwater management facilities suitable for retrofit. No sites were identified that could accommodate new facilities to control existing developed areas. Results from the hydrologic analysis were used to help rank potential retrofits in terms of quantity and flooding control potential. In addition, rankings for SWM need were developed, based on subwatershed size and increase in ***one year runoff*** due to development. Three retrofit projects were recommended for final design, permitting, and construction. Locations and description of the proposed retrofits are shown in Figure 3



<u>Proposed Retrofit Project</u>	<u>Subwatershed Location</u>	<u>Description</u>
Olney Mill Family Park Pond	Upper Olney Mill	Convert pond into an extended detention facility that will provide runoff quantity control for 495 acres.
Lake Hallowell	Upper James Creek	Increase the flow released from the lake to provide greater minimum flow to the receiving stream throughout the year
Sandy Spring Meadow Dry Pond	Lower Hawlings	Convert the existing dry pond into an extended detention facility for enhanced runoff quantity and quality control for 28 acres.

Retrofit Types

Dry Ponds/Extended Detention Facilities

Dry ponds or detention ponds are structures which temporarily hold stormwater after a storm, but remain dry between events. After the storm, the water is slowly discharged to a stream. This slow discharge replaces the gushing rush of uncontrolled stormwater that can tear down stream banks and cause severe flooding. Two of the three proposed retrofits will produce extended detention dry ponds.

The first proposed retrofit will convert an old farm pond left after the Olney Mill subdivision was built out. During 1995-1996, a shallow marsh/wetland pond was built to provide water quality benefits upstream of the proposed retrofit. There is severe downstream channel erosion because of lack of stormwater quantity control in this subdivision.

The second will convert an existing dry pond in Sandy Spring Meadows to provide enhanced water quantity and quality benefits. The downstream channel is suffering from severe erosion which should be reduced when peak discharges from the pond are reduced.



Wet Ponds

These facilities all include a permanent pool of water. They provide quantity and quality control by storing runoff which thus reduces downstream flooding and erosion and by providing time for pollutants to settle out. Wet ponds are designed typically to detain a certain amount of stormwater runoff for up to 24 hours after a storm, and to trap incoming sediment where it can easily be removed. Wet ponds have aesthetic value when planted with wetland vegetation which also provides habitat for many species of fish, frogs, bats, and birds.

The third proposed project is to Lake Hallowell, a regional wet pond with a drainage area of about 800 acres. There is little to no discharge from the lake outlet during summer months which adversely affects baseflow in the receiving stream. The proposed retrofit consists of small improvements on the outlet control structure and intake pipe to increase detention time and provide consistent minimum baseflow.

Glossary

Best Management Practices (BMPs): Techniques used to control adverse environmental impacts from human activities, examples of which are stormwater management ponds and no-till farming.

Capital Improvement Program (CIP): Program which provides funding for the construction of projects to provide long-term benefits. Examples include roads, schools, and stormwater management facilities.

Erosion: The wearing away of rock or soil by the gradual detachment of particles by water, wind, ice or other mechanical or biological forces.

Hydrologic analysis: Predicting the amount and pattern of stormwater runoff based on land cover and soil conditions in the contributing drainage area

Invasive plant: Type of vegetation that is characterized by rapid growth and an ability to spread throughout and over existing vegetation and which prevents the establishment of other, more desirable plants

Mainstem: The stream reach with the highest stream order (largest number of tributaries) in a watershed or subwatershed.

Nonpoint source: Coming from diffuse sources, such as from the air, in groundwater, or water flowing over land.

One-year runoff: The amount of runoff from a storm that is expected to occur once per year (2.6" rain in a 24 hour period).

Retrofit: An expansion or renovation of an existing stormwater management facility.

Riparian Buffer: The land area immediately adjacent on both sides of a stream. Important in filtering stormwater runoff, maintaining stream system physical stability, and providing wildlife habitat.

Sedimentation: Process when soil particles that were suspended in flowing water settle out onto the bottom, which can cover the habitat of aquatic insects and disrupt the natural flow of the stream.

Stream Restoration: Practices used to address existing stream degradation to restore stream bank and channel stability and produce an improved instream biological community

Stormwater management (SWM): Measures taken to limit the amount of stormwater runoff from roads, buildings, rooftops, and parking lots. Examples are dry ponds, extended detention facilities, and wet ponds.

Subwatershed: A smaller but distinct drainage area that is contained within a watershed.

Watershed: All the land area which contributes runoff to a particular point along a waterway.

Who to Call If you Have a Watershed or Water Quality Question:

Montgomery County Agencies

Department of Environmental Protection (DEP)

<http://www.montgomerycountymd.gov/siteHead.asp?page=/mc/services/dep/index.html>

Countywide Monitoring	240-777-7726
Hawlings River Watershed Restoration	240-777-7711
Illegal Dumping Hotline.....	240-777-7700
Rainscapes	240-777-7720
Stormwater Management Structures	240-777-7744
Water Pollution.....	240-777-7770
Watershed Outreach and Stewardship.....	240-777-7714

Department of Permitting Services (DPS)

Sediment from construction site entering streams	240-777-6366
Stormwater management and sediment control plan review issues	240-777-6320
Water supply wells and septic tank issues.....	240-777-6300

Department of Public Works and Transportation (DPWT)

Blocked storm drain, inlet pipe or erosion from public storm drain	240-777-ROAD
Recycling and hazardous household waste disposal	240-777-6400

Soil Conservation District

Agricultural best management practices	301-590-2855
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Inter-County Agencies

Maryland-National Capital Park and Planning Commission (M-NCPPC)

Problems with streams, trash and debris in County parks and in streams	301-495-2535
Weed Warriors (Volunteer Invasive Plant Control Program)	301-495-2464

Washington Suburban Sanitary Commission (WSSC)

Patuxent Reservoirs Watershed Protection Agreement.....	301-206-8100
Discolored or odorous drinking water; sanitary sewer problems.....	301-206-4002

Maryland State Agencies

Maryland Department of the Environment (MDE)

Emergency Response (hazardous materials spills or discharges)	410-537-3937
Fish kills	410-974-3238

Department of Natural Resources (DNR)

Illegal dumping on state park land	301-924-2127
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